

Pyramid Nanostructured Coatings for Stray Light Suppression, Phase I

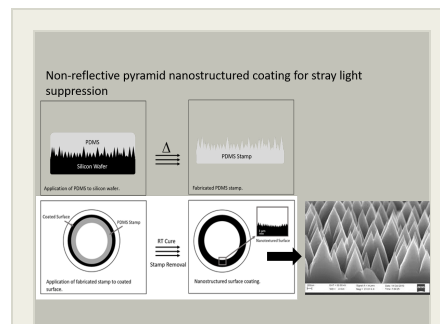
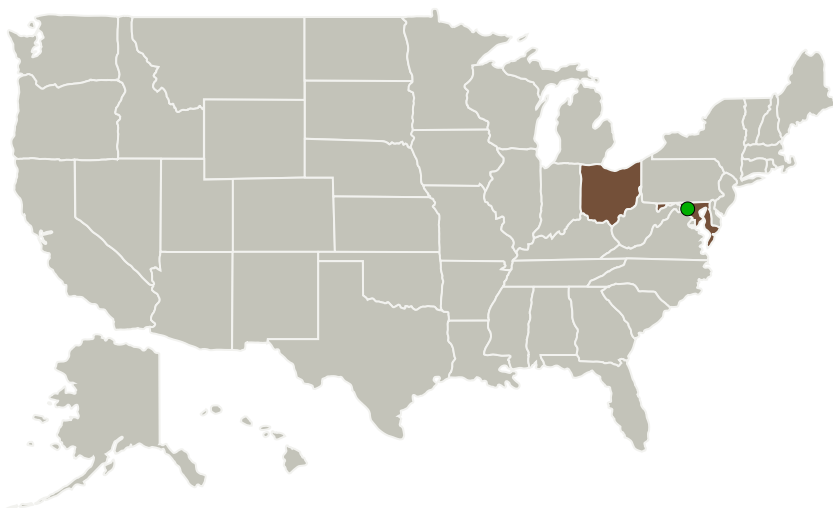
Completed Technology Project (2017 - 2017)



Project Introduction

State of the Art In-Space Telescopic imagery suffers from deleterious effects of image quality due to radiation, in the form of stray visible light. While treatments to reduce the impact of stray light exist, the effectiveness of these treatments have limitations thereby limiting the range and reliability of astrophysical telescopic imagery. NASA is seeking a scalable, highly effective solution to reduce and/or eliminate the impact of stray light. Applied Sciences, Inc. (ASI) proposes Applied Sciences proposes a unique solution for stray light suppression in space flight instruments. The innovation utilizes non-reflective/nano-structured polymer coatings combined with a proven and scalable process that yields a light trapping nano-textured surface. Stacked-cup carbon nanotubes will provide additional absorptive properties to a currently-used aerospace qualified resin system (legacy material). A non-reflecting surface will be fabricated by plasma etching and replication into pyramidal nanostructures for broadband absorption with efficiency at or better than 99.9%. This new approach comes at a much lower cost, is readily scalable and safer than the competing technology. ASI has previous success formulating spray-able room temperature cured coatings with tailored reflectivity and is working with U.S. Air Force to scale-up the nanomaterial enhanced coatings manufacturing capability. That separate effort, and the use of a (modified/enhanced-) legacy material, will benefit the proposed effort as it will enable rapid verification, qualification, and transition of the technology.

Primary U.S. Work Locations and Key Partners



Pyramid Nanostructured Coatings for Stray Light Suppression, Phase I Briefing Chart Image

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3

Pyramid Nanostructured Coatings for Stray Light Suppression, Phase I

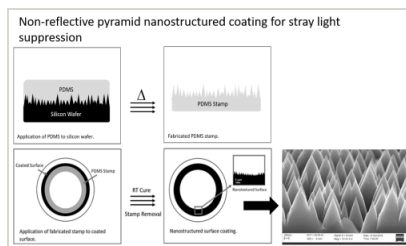
Completed Technology Project (2017 - 2017)



Organizations Performing Work	Role	Type	Location
Applied Sciences Inc	Lead Organization	Industry	Cedarville, Ohio
 Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Ohio

Images



Briefing Chart Image

Pyramid Nanostructured Coatings for Stray Light Suppression, Phase I Briefing Chart Image
(<https://techport.nasa.gov/image/127392>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Applied Sciences Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

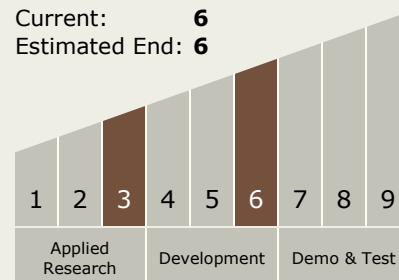
Carlos Torrez

Principal Investigator:

Carla L Lake

Technology Maturity (TRL)

Start: 3
Current: 6
Estimated End: 6



Pyramid Nanostructured Coatings for Stray Light Suppression, Phase I

Completed Technology Project (2017 - 2017)



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.5 Coatings